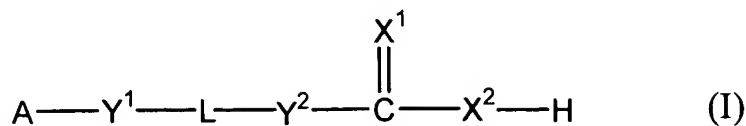


# WHAT IS CLAIMED IS:

1. A compound of formula (I):



wherein

A is a cyclic moiety selected from the group consisting of C<sub>3-14</sub> cycloalkyl, 3-14 membered heterocycloalkyl, C<sub>4-14</sub> cycloalkenyl, 3-14 membered heterocycloalkenyl, aryl, or heteroaryl; the cyclic moiety being optionally substituted with alkyl, alkenyl, alkynyl, alkoxy, hydroxyl, hydroxylalkyl, halo, haloalkyl, amino, alkylcarbonyloxy, alkyloxycarbonyl, alkylcarbonyl, alkylsulfonylamino, aminosulfonyl, or alkylsulfonyl;

each of X<sup>1</sup> and X<sup>2</sup>, independently, is O or S;

each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-, -S-, -N(R<sup>a</sup>)-, -N(R<sup>a</sup>)-C(O)-O-, -O-C(O)-N(R<sup>a</sup>)-, -N(R<sup>a</sup>)-C(O)-N(R<sup>b</sup>)-, -O-C(O)-O-, or a bond; each of R<sup>a</sup> and R<sup>b</sup>, independently, being hydrogen, alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, hydroxyl, or haloalkyl;

L is a straight C<sub>3-12</sub> hydrocarbon chain optionally containing at least one double bond, at least one triple bond, or at least one double bond and one triple bond; said hydrocarbon chain being optionally substituted with C<sub>1-4</sub> alkyl, C<sub>2-4</sub> alkenyl, C<sub>2-4</sub> alkynyl, C<sub>1-4</sub> alkoxy, hydroxyl, halo, amino, nitro, cyano, C<sub>3-5</sub> cycloalkyl, 3-5 membered heterocycloalkyl, monocyclic aryl, 5-6 membered heteroaryl, C<sub>1-4</sub> alkylcarbonyloxy, C<sub>1-4</sub> alkyloxycarbonyl, C<sub>1-4</sub> alkylcarbonyl, or formyl; and further being optionally interrupted by -O-, -N(R<sup>c</sup>)-, -N(R<sup>c</sup>)-C(O)-O-, -O-C(O)-N(R<sup>c</sup>)-, -N(R<sup>c</sup>)-C(O)-N(R<sup>d</sup>)-, or -O-C(O)-O-; each of R<sup>c</sup> and R<sup>d</sup>, independently, being hydrogen, alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, hydroxyl, or haloalkyl; provided that when L contains two or more double bonds, the double bonds are not adjacent to each other; and further provided that when L contains less than 6 carbon atoms in the hydrocarbon chain, Y<sup>1</sup> is not a bond; or a salt thereof.

2. The compound of claim 1, wherein X<sup>1</sup> is O.

3. The compound of claim 1, wherein  $X^2$  is O.

4. The compound of claim 1, wherein each of  $X^1$  and  $X^2$  is O.

5. The compound of claim 1, wherein each of  $Y^1$  and  $Y^2$ , independently, is  $-CH_2-$ ,  $-O-$ ,  $-N(R^a)-$ , or a bond.

6. The compound of claim 1, wherein L is a saturated  $C_{3-8}$  hydrocarbon chain optionally substituted with  $C_{1-2}$  alkyl,  $C_{1-2}$  alkoxy, hydroxyl,  $-NH_2$ ,  $-NH(C_{1-2} \text{ alkyl})$ , or  $-N(C_{1-2} \text{ alkyl})_2$ .

7. The compound of claim 1, wherein L is an unsaturated  $C_{4-8}$  hydrocarbon chain containing at least one double bond and no triple bond, said unsaturated hydrocarbon chain being optionally substituted with  $C_{1-2}$  alkyl,  $C_{1-2}$  alkoxy, hydroxyl,  $-NH_2$ ,  $-NH(C_{1-2} \text{ alkyl})$ , or  $-N(C_{1-2} \text{ alkyl})_2$ .

8. The compound of claim 7, wherein the double bond is in trans configuration.

9. The compound of claim 1, wherein L is an unsaturated  $C_{4-8}$  hydrocarbon chain containing at least one double bond and one triple bond, said unsaturated hydrocarbon chain being optionally substituted with  $C_{1-2}$  alkyl,  $C_{1-2}$  alkoxy, hydroxyl,  $-NH_2$ ,  $-NH(C_{1-2} \text{ alkyl})$ , or  $-N(C_{1-2} \text{ alkyl})_2$ .

10. The compound of claim 9, wherein the double bond is in trans configuration.

11. The compound of claim 1, wherein A is a  $C_{5-8}$  cycloalkenyl or 5-8 membered heteroalkenyl containing at least two double bonds.

12. The compound of claim 1, wherein A is phenyl, naphthyl, indanyl, or tetrahydronaphthyl.

13. The compound of claim 1, wherein A is phenyl optionally substituted with alkyl alkenyl, alkynyl, alkoxy, hydroxyl, hydroxylalkyl, halo, haloalkyl, or amino.

1 14. The compound of claim 13, wherein L is a C<sub>3-8</sub> saturated hydrocarbon chain optionally  
2 substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or  
3 -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 15. The compound of claim 14, wherein X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

1 16. The compound of claim 13, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain  
2 containing only double bonds in trans configuration, said unsaturated hydrocarbon chain  
3 being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or  
4 -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 17. The compound of claim 16, wherein X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

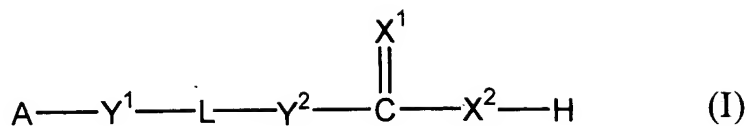
1 18. The compound of claim 13, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain  
2 containing at least one double bond and one triple bond, said unsaturated hydrocarbon chain  
3 being substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or  
4 -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 19. The compound of claim 18, wherein X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

1 20. The method of claim 1, said compound being 4-chloro-5-phenyl-2,4-pentadienoic acid, 5-  
2 (4-dimethylaminophenyl)-2,4-pentadienoic acid, 5-(2-furyl)-2,4-pentadienoic acid, 5-phenyl-  
3 2-en-4-yn-pentanoic acid, 7-phenyl-2,4,6-heptatrienoic acid, or 8-phenyl-3,5,7-octatrienoic  
4 acid.

1 21. The method of claim 1, said compound being 7-phenyl-2,4,6-heptatrienoic acid or 8-  
2 phenyl-3,5,7-octatrienoic acid.

22. A compound of formula (I):



wherein

A is a cyclic moiety selected from the group consisting of aryl or heteroaryl; the cyclic moiety being optionally substituted with alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, or amino;

each of  $\text{X}^1$  and  $\text{X}^2$ , independently, is O or S;

each of  $\text{Y}^1$  and  $\text{Y}^2$ , independently, is  $-\text{CH}_2-$ ,  $-\text{O}-$ ,  $-\text{S}-$ ,  $-\text{N}(\text{R}^a)-$ ,  $-\text{N}(\text{R}^a)-\text{C}(\text{O})-\text{O}-$ ,  $-\text{O}-\text{C}(\text{O})-\text{N}(\text{R}^a)-$ ,  $-\text{N}(\text{R}^a)-\text{C}(\text{O})-\text{N}(\text{R}^b)-$ ,  $-\text{O}-\text{C}(\text{O})-\text{O}-$ , or a bond; each of  $\text{R}^a$  and  $\text{R}^b$ , independently, being hydrogen, alkyl, hydroxylalkyl, or haloalkyl;

L is a straight  $\text{C}_{3-12}$  hydrocarbon chain optionally containing at least one double bond, at least one triple bond, or at least one double bond and one triple bond; said hydrocarbon chain being optionally substituted with  $\text{C}_{1-4}$  alkyl,  $\text{C}_{2-4}$  alkenyl,  $\text{C}_{2-4}$  alkynyl,  $\text{C}_{1-4}$  alkoxy, or amino, and further optionally interrupted by  $-\text{O}-$  or  $-\text{N}(\text{R}^c)-$ , where  $\text{R}^c$  is hydrogen, alkyl, hydroxylalkyl, or haloalkyl; provided that when L contains two or more double bonds, the double bonds are not adjacent to each other; and further provided that when L contains less than 6 carbon atoms in the hydrocarbon chain,  $\text{Y}^1$  is not a bond; or a salt thereof.

23. The compound of claim 22, wherein L is a  $\text{C}_{3-8}$  saturated hydrocarbon chain optionally substituted with  $\text{C}_{1-2}$  alkyl,  $\text{C}_{1-2}$  alkoxy, hydroxyl,  $-\text{NH}_2$ ,  $-\text{NH}(\text{C}_{1-2} \text{ alkyl})$ , or  $-\text{N}(\text{C}_{1-2} \text{ alkyl})_2$ .

24. The compound of claim 23, wherein  $\text{X}^1$  is O;  $\text{X}^2$  is O; and each of  $\text{Y}^1$  and  $\text{Y}^2$ , independently, is  $-\text{CH}_2-$ ,  $-\text{O}-$ ,  $-\text{N}(\text{R}^a)-$ , or a bond.

25. The compound of claim 22, wherein L is an unsaturated  $\text{C}_{4-8}$  hydrocarbon chain containing only double bonds in trans configuration, said unsaturated hydrocarbon chain

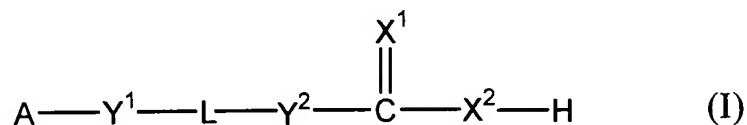
being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

26. The compound of claim 25, wherein X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

27. The compound of claim 22, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain containing at least one double bond and one triple bond, said unsaturated hydrocarbon chain being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

28. The compound of claim 27, wherein X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

29. A compound of formula (I):



wherein

A is a heteroaryl optionally substituted with alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, or amino;

each of X<sup>1</sup> and X<sup>2</sup>, independently, is O or S;

each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-, -S-, -N(R<sup>a</sup>)-, -N(R<sup>a</sup>)-C(O)-O-, -O-C(O)-N(R<sup>a</sup>)-, -N(R<sup>a</sup>)-C(O)-N(R<sup>b</sup>)-, -O-C(O)-O-, or a bond; each of R<sup>a</sup> and R<sup>b</sup>, independently, being hydrogen, alkyl, hydroxylalkyl, or haloalkyl;

L is a straight C<sub>3-12</sub> hydrocarbon chain optionally containing at least one double bond, at least one a triple bond, or at least one double bond and one triple bond; said hydrocarbon chain being optionally substituted with C<sub>1-4</sub> alkyl, C<sub>2-4</sub> alkenyl, C<sub>2-4</sub> alkynyl, C<sub>1-4</sub> alkoxy, or amino, and further optionally interrupted by -O- or -N(R<sup>c</sup>)-, where R<sup>c</sup> is hydrogen, alkyl, hydroxylalkyl, or haloalkyl;

or a salt thereof.

1 30. The compound of claim 29, wherein L is a C<sub>3-8</sub> saturated hydrocarbon chain optionally  
2 substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or  
3 -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 31. The compound of claim 30, wherein X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

1 32. The compound of claim 29, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain  
2 containing at least one double bond in trans configuration and no triple bond, said  
3 unsaturated hydrocarbon chain being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy,  
4 hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 33. The compound of claim 32, wherein X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

1 34. The compound of claim 29, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain  
2 containing at least one double bond and one triple bond, said unsaturated hydrocarbon chain  
3 being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>,  
4 -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 35. The compound of claim 34, wherein X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

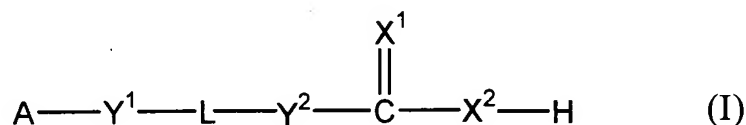
1 36. The compound of claim 29, wherein A is furyl, thienyl, pyrrolyl, or pyridyl.

1 37. The compound of claim 36, wherein L is a C<sub>3-8</sub> saturated hydrocarbon chain optionally  
2 substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or  
3 -N(C<sub>1-2</sub> alkyl)<sub>2</sub>; X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-,  
4 -N(R<sup>a</sup>)-, or a bond.

38. The compound of claim 36, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain containing at least one double bond in trans configuration and no triple bond, said unsaturated hydrocarbon chain being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>; X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

39. The compound of claim 36, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain containing at least one double bond and one triple bond, said unsaturated hydrocarbon chain being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>; X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

40. A compound of formula (I):



wherein

A is a phenyl optionally substituted with alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, or amino;

each of X<sup>1</sup> and X<sup>2</sup>, independently, is O or S;

each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, -N(R<sup>a</sup>)-C(O)-O-, -O-C(O)-N(R<sup>a</sup>)-, -N(R<sup>a</sup>)-C(O)-N(R<sup>b</sup>)-, -O-C(O)-O-, or a bond; each of R<sup>a</sup> and R<sup>b</sup>, independently, being hydrogen, alkyl, hydroxylalkyl, or haloalkyl;

L is a straight C<sub>3-12</sub> hydrocarbon chain containing at least one double bond and one triple bond; said hydrocarbon chain being optionally substituted with C<sub>1-4</sub> alkyl, C<sub>2-4</sub> alkenyl, C<sub>2-4</sub> alkynyl, C<sub>1-4</sub> alkoxy, or amino, and further optionally interrupted by -O- or -N(R<sup>c</sup>)-, where R<sup>c</sup> is hydrogen, alkyl, hydroxylalkyl, or haloalkyl; or a salt thereof.

41. The compound of claim 40, wherein L is a C<sub>3-8</sub> saturated hydrocarbon chain optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

42. The compound of claim 41, wherein X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

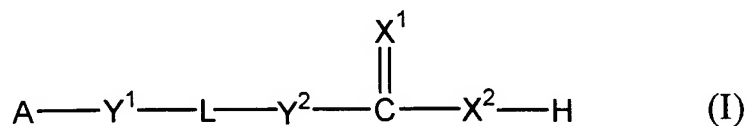
43. The compound of claim 40, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain containing at least one double bond in trans configuration and no triple bond, said unsaturated hydrocarbon chain being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

44. The compound of claim 43, wherein X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

45. The compound of claim 40, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain containing at least one double bond and one triple bond, said unsaturated hydrocarbon chain being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

46. The compound of claim 45, wherein X<sup>1</sup> is O; X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>a</sup>)-, or a bond.

47. A compound of formula (I):



wherein

5 A is a saturated branched C<sub>3-12</sub> hydrocarbon chain or an unsaturated branched C<sub>3-12</sub>  
6 hydrocarbon chain optionally interrupted by -O-, -S-, -N(R<sup>a</sup>)-, -C(O)-, -N(R<sup>a</sup>)-SO<sub>2</sub>-, -SO<sub>2</sub>-  
7 N(R<sup>a</sup>)-, -N(R<sup>a</sup>)-C(O)-O-, -O-C(O)-N(R<sup>a</sup>)-, -N(R<sup>a</sup>)-C(O)-N(R<sup>b</sup>)-, -O-SO<sub>2</sub>-, -SO<sub>2</sub>-O-, or  
8 -O-C(O)-O- where each of R<sup>a</sup> and R<sup>b</sup>, independently, is hydrogen, alkyl, alkenyl, alkynyl,  
9 alkoxy, hydroxylalkyl, hydroxyl, or haloalkyl; each of the saturated and the unsaturated  
10 branched hydrocarbon chain being optionally substituted with alkyl, alkenyl, alkynyl, alkoxy,  
11 hydroxyl, hydroxylalkyl, halo, haloalkyl, amino, alkylcarbonyloxy, alkyloxycarbonyl,  
12 alkylcarbonyl, alkylsulfonylamino, aminosulfonyl, or alkylsulfonyl;

13 each of X<sup>1</sup> and X<sup>2</sup>, independently, is O or S;

14 each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-, -S-, -N(R<sup>c</sup>)-, -C(O)-, -N(R<sup>c</sup>)-SO<sub>2</sub>-,  
15 -SO<sub>2</sub>-N(R<sup>c</sup>)-, -N(R<sup>c</sup>)-C(O)-O-, -O-C(O)-N(R<sup>c</sup>)-, -N(R<sup>c</sup>)-C(O)-N(R<sup>d</sup>)-, -O-SO<sub>2</sub>-, -SO<sub>2</sub>-O-,  
16 -O-C(O)-O-, or a bond; each of R<sup>c</sup> and R<sup>d</sup>, independently, being hydrogen, alkyl, alkenyl,  
17 alkynyl, alkoxy, hydroxylalkyl, hydroxyl, or haloalkyl;

18 L is a straight C<sub>2-12</sub> hydrocarbon chain optionally containing at least one double bond,  
19 at least one a triple bond, or at least one double bond and one triple bond; said hydrocarbon  
20 chain being optionally substituted with C<sub>1-4</sub> alkyl, C<sub>2-4</sub> alkenyl, C<sub>2-4</sub> alkynyl, C<sub>1-4</sub> alkoxy,  
21 hydroxyl, halo, amino, nitro, cyano, C<sub>3-5</sub> cycloalkyl, 3-5 membered heterocycloalkyl,  
22 monocyclic aryl, 5-6 membered heteroaryl, C<sub>1-4</sub> alkylcarbonyloxy,  
23 C<sub>1-4</sub> alkyloxycarbonyl, C<sub>1-4</sub> alkylcarbonyl, or formyl; and further being optionally interrupted  
24 by -O-, -S-, -N(R<sup>e</sup>)-, -C(O)-, -N(R<sup>e</sup>)-SO<sub>2</sub>-, -SO<sub>2</sub>-N(R<sup>e</sup>)-, -N(R<sup>e</sup>)-C(O)-O-, -O-C(O)-N(R<sup>e</sup>)-,  
25 -N(R<sup>e</sup>)-C(O)-N(R<sup>f</sup>)-, -O-SO<sub>2</sub>-, -SO<sub>2</sub>-O-, or -O-C(O)-O-; each of R<sup>e</sup> and R<sup>f</sup>, independently,  
26 being hydrogen, alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, hydroxyl, or haloalkyl;  
27 provided that when L contains two or more double bonds, the double bonds are not adjacent  
28 to each other; and further provided that A contains a heteroatom selected from the group  
29 consisting of O, S, or N or a double or triple bond;  
30 or a salt thereof.

1 48. The compound of claim 47, wherein X<sup>1</sup> is O.

1 49. The compound of claim 47, wherein X<sup>1</sup> is O.

1 50. The compound of claim 47, wherein each of X<sup>1</sup> and X<sup>2</sup> is O.

1 51. The compound of claim 47, wherein each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>-, -O-,  
2 -N(R<sup>c</sup>)-, or a bond.

1 52. The compound of claim 47, wherein each of Y<sup>1</sup> and Y<sup>2</sup>, independently, is -CH<sub>2</sub>- or a  
2 bond.

1 53. The compound of claim 47, wherein L is a saturated C<sub>3-8</sub> hydrocarbon chain optionally  
2 substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or  
3 -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 54. The compound of claim 47, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain  
2 containing at least one double bond and no triple bond, said unsaturated hydrocarbon chain  
3 being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>,  
4 -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 55. The compound of claim 54, wherein the double bond is in trans configuration.

1 56. The compound of claim 47, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain  
2 containing at least one double bond and one triple bond; said unsaturated hydrocarbon chain  
3 being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>,  
4 -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 57. The compound of claim 56, wherein the double bond is in trans configuration.

1 58. The compound of claim 47, wherein A is a saturated branched C<sub>4-10</sub> hydrocarbon chain  
2 interrupted by -N(R<sup>a</sup>)-, -N(R<sup>a</sup>)-C(O)-O-, -O-C(O)-N(R<sup>a</sup>)-, -N(R<sup>a</sup>)-C(O)-N(R<sup>b</sup>)-, -O-C(O)-, or  
3 -C(O)-O- where each of R<sup>a</sup> and R<sup>b</sup>, independently, is hydrogen, alkyl, alkoxy, hydroxylalkyl,  
4 or hydroxyl.

1 59. The compound of claim 58, wherein L is a saturated C<sub>3-8</sub> hydrocarbon chain optionally  
2 substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or  
3 -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 60. The compound of claim 59, wherein each of X<sup>1</sup> and X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>c</sup>)-, or a bond.

1 61. The compound of claim 58, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain  
2 containing only double bonds, said unsaturated hydrocarbon chain being optionally  
3 substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or  
4 -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 62. The compound of claim 61, wherein each of X<sup>1</sup> and X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>c</sup>)-, or a bond.

1 63. The compound of claim 58, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain  
2 containing at least one double bond and one triple bond; said unsaturated hydrocarbon chain  
3 being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>,  
4 -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 64. The compound of claim 63, wherein each of X<sup>1</sup> and X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>c</sup>)-, or a bond.

1 65. The compound of claim 47, wherein A is an unsaturated branched C<sub>4-10</sub> hydrocarbon  
2 chain optionally interrupted by -N(R<sup>a</sup>)-, -N(R<sup>a</sup>)-C(O)-O-, -O-C(O)-N(R<sup>a</sup>)-,  
3 -N(R<sup>a</sup>)-C(O)-N(R<sup>b</sup>)-, -O-C(O)-, or -C(O)-O- where each of R<sup>a</sup> and R<sup>b</sup>, independently, is  
4 hydrogen, alkyl, alkoxy, hydroxylalkyl, or hydroxyl.

1 66. The compound of claim 65, wherein A contains at least one double bond in trans  
2 configuration and no triple bond.

1 67. The compound of claim 66, wherein L is a saturated C<sub>3-8</sub> hydrocarbon chain optionally  
2 substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or  
3 -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 68. The compound of claim 67, wherein each of X<sup>1</sup> and X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>c</sup>)-, or a bond.

1 69. The compound of claim 66, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain  
2 containing at least one double bond in trans configuration and no triple bond, said  
3 unsaturated hydrocarbon chain being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy,  
4 hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 70. The compound of claim 69, wherein each of X<sup>1</sup> and X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>c</sup>)-, or a bond.

1 71. The compound of claim 66, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain  
2 containing at least one double bond in trans configuration and one triple bond; said  
3 unsaturated hydrocarbon chain being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy,  
4 hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 72. The compound of claim 71, wherein each of X<sup>1</sup> and X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>c</sup>)-, or a bond.

1 73. The compound of claim 65, wherein A contains at least one double bond and one triple  
2 bond.

1 74. The compound of claim 73, wherein L is a saturated C<sub>3-8</sub> hydrocarbon chain optionally  
2 substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or  
3 -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 75. The compound of claim 74, wherein each of X<sup>1</sup> and X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>c</sup>)-, or a bond.

1 76. The compound of claim 73, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain  
2 containing only double bonds, said unsaturated hydrocarbon chain being optionally  
3 substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>, -NH(C<sub>1-2</sub> alkyl), or  
4 -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 77. The compound of claim 76, wherein each of X<sup>1</sup> and X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>c</sup>)-, or a bond.

1 78. The compound of claim 73, wherein L is an unsaturated C<sub>4-8</sub> hydrocarbon chain  
2 containing at least one double bond and one triple bond; said unsaturated hydrocarbon chain  
3 being optionally substituted with C<sub>1-2</sub> alkyl, C<sub>1-2</sub> alkoxy, hydroxyl, -NH<sub>2</sub>,  
4 -NH(C<sub>1-2</sub> alkyl), or -N(C<sub>1-2</sub> alkyl)<sub>2</sub>.

1 79. The compound of claim 78, wherein each of X<sup>1</sup> and X<sup>2</sup> is O; and each of Y<sup>1</sup> and Y<sup>2</sup>,  
2 independently, is -CH<sub>2</sub>-, -O-, -N(R<sup>c</sup>)-, or a bond.